



Total No. of Questions : 21
 Total No. of Printed Pages : 2

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Part - III

PHYSICS - PAPER - II 2186801

(English Version)

Time : 3 Hours

Max. Marks : 60

Note : Read the following instructions carefully.

- Answer all the questions of Section-A. Answer any six questions in Section-B and answer any two questions in Section-C.
- In Section-A, questions from Sr. Nos. 1 to 10 are Very Short Answer Type. Each question carries two marks. Answer all questions at one place in the same order.
- In Section-B, questions from Sr. Nos. 11 to 18 are of Short Answer Type. Each question carries four marks.
- In Section-C, questions from Sr. Nos. 19 to 21 are of Long Answer Type. Each question carries eight marks.

SECTION - A



10x2=20

Note : Answer all questions.



- What is dispersion ? Which colour gets relatively more dispersed ?
- State Ampere's Law and Biot-Savart Law.
- What happens to compass needles at the Earth's poles ?
- The horizontal component of the earth's magnetic field at a certain place is 2.6×10^{-5} T and the angle of dip is 60° . What is the magnetic field of the earth at this location ?
- Obtain the resonant frequency ω_r of a series LCR circuit with $L=2.0$ H, $C=32 \mu\text{F}$ and $R=10 \Omega$.
- What is the principle of production of electromagnetic waves ?
- State Heisenberg's Uncertainty Principle.
- The work function of Caesium is 2.14 eV. Find the Threshold frequency for Caesium.
- Write the truth table of NAND gate. How does it differ from AND gate ?
- Define modulation. Why is it necessary ?



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II

SECTION - B

Note : Answer *any six* questions.



6x4=24

11. Define focal length of a concave mirror. Prove that the radius of curvature of a concave mirror is double its focal length.
12. How do you determine the resolving power of your eye?
13. Derive an expression for the intensity of the electric field at a point on the equatorial plane of an electric dipole.
14. Derive an expression for the capacitance of a parallel plate capacitor.
15. A current of 10 A passes through two very long wires held parallel to each other and separated by a distance of 1 m. What is the force per unit length between them ?
16. Current in a circuit falls from 5.0 A to 0.0 A in 0.1 s. If an average emf of 200 V is induced, give an estimate of the self inductance of the circuit.
17. What are the limitations of Bohr's theory of hydrogen atom ?
18. What is rectification ? Explain the working of a full wave rectifier.



SECTION - C

Note : Answer *any two* questions.

2x8=16

19. What is Doppler Shift ? Obtain an expression for the apparent frequency of sound heard when the observer is in motion with respect to a source at rest.
20. (a) State Kirchoff's Law for an electrical network. Using these laws deduce the condition for balance in a Wheatstone Bridge.
 (b) A battery of emf 10 V and internal resistance 3Ω is connected to a resistor : If the current in the circuit is 0.5 A, what is the resistance of the resistor ?
21. (a) What is radioactivity ? State the law of radioactive decay. Show that radioactive decay is exponential in nature.
 (b) Compare the radii of the nuclei of mass numbers 27 and 64.



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